

Tree Growth and Nutrient Status in a Water Harvesting
System Using Potable and Reclaimed Water

RMRS-99099-RJVA

TREE GROWTH AND NUTRIENT STATUS IN A WATER HARVESTING SYSTEM USING POTABLE AND RECLAIMED WATER

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FINAL

A Progress Report

For the Period August 1, 2000 through December 31, 2000

to

U.S. Department of Agriculture—Forest Service
Rocky Mountain Research Station
Research Work Unit Number #RM-4651

Research Joint Venture Agreement #RMRS-99099-RJVA

from

Martin M. Karpiscak
Office of Arid Lands Studies
The University of Arizona
Tucson Arizona 85719

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INTRODUCTION

The purpose of this agreement is to conduct continuing research on the growth of six species of trees using potable and reclaimed water in conjunction with water harvesting techniques. The research will provide critically needed information on alternative management strategies for sustaining riparian trees in arid areas with falling water tables due to increasing development. This project is being continued to allow experimental trees adequate time to respond developmentally to the effect of treatments. Specific objectives of this project include

- a. continued maintenance of 300 field- and 120 container-grown trees,
- b. monitoring tree growth, and
- c. collection and analysis of soil, water and plant tissue samples.

The Forest Service is responsible for on-going research regarding all areas of forest research and management, including sustaining the health of riparian areas in the Southwest and tree species that inhabit areas threatened by falling water tables. The Forest Service's interest in this agreement is in the potential for alternative water supplies to maintain these critical riparian zones as development decreases surface water supplies. The Forest Service is interested also in acquiring data on the growth of these trees growing under arid conditions and on using water harvesting techniques to concentrate available rainwater as a supplemental water supply. In addition, the Forest Service is interested in techniques that may be applicable to other arid regions of the United States and the world.

This report discusses the research activities for the period August 1, 2000 through December 31, 2000.

GOALS

This project will

1. provide daily maintenance of the experimental trees, including their irrigation, weeding the soil around them, and keeping the irrigation system supplying them water in good repair;
2. monitor and document the growth and health of the experimental trees during the growing season in accordance with the mutually approved study plan; and
3. collect and analyze soil, water and plant tissue samples in accordance with the mutually approved study plan.

STATUS OF WORK

During the period of this progress report, tissue samples from both the field plantings and the container experiments as well as soil samples are in process of being analyzed. All the samples of plant tissue from the field plots (approximately 260 samples) were dried, ground, composited and analyzed. Soil samples previously taken from the field have been completed.

The analysis of tissue samples from the container samples are nearly completed. Some 400 individual samples of the roots, trunks, stems and leaves of the container plants have been dried, ground, composited and partially analyzed (about 70 percent).

Monitoring activities of the field-grown trees continued during the reporting period and will continue until the trees are harvested by mid-2001. We continue talking to potentially-interested parties about providing pole cuttings from the harvested trees for new plantings in a revegetation effort along a portion of the Santa Cruz River north of Tucson.

FUTURE ACTIVITIES

The field tree plots will be maintained until harvest in mid-2001. Plans currently call for the remaining field trees to be monitored according to the study plan until final harvest. After fully leafed, the trees will be harvested in April or May of 2001, and the total above-ground biomass of each tree determined at harvest.

Laboratory analysis of the samples from the container tissue samples for selected chemical parameters will continue. Data analysis will proceed on the completed tissues samples from the field. Data evaluation of the container plants will be conducted upon completion of the laboratory testing of the remaining tissue samples to determine whether any correlation exists between species and source of irrigation water.